1. A nerve regeneration conduit comprising a porous biocompatible support comprising an inner surface and an outer surface, the support being in the form of a roll such that a cross section of the roll approximates a spiral spanning from 8 to 40 rotations, with the outer surface of the support facing outward, relative to the origin of the spiral.

2. The nerve regeneration conduit of claim 1, wherein the support has a thickness of 5 to 200 μm.

3. The nerve regeneration conduit of claim 1, wherein the support has a thickness of 10 to 100 μm.

4. The nerve regeneration conduit of claim 1, wherein the support comprises a biological material.

5. The nerve regeneration conduit of claim 4, wherein the biological material is small intestinal submucosa.

6. The nerve regeneration conduit of claim 1, wherein the support comprises a synthetic polymer.

7. The nerve regeneration conduit of claim 1, wherein the support is bioresorbable.

8. The nerve regeneration conduit of claim 6, wherein the synthetic polymer is selected from the group consisting of polyhydroxyalkanoates, e.g., polyhydroxybutyric acid; polyesters, e.g., polyglycolic acid (PGA); copolymers of glycolic acid and lactic acid (PLGA); copolymers of lactic acid and ε-aminocaproic acid; polycaprolactones; polydesoxazon (PDS); copolymers of hydroxybutyric acid and hydroxyvaleric acid; polyesters of succinic acid; polylactic acid (PLA); cross-linked hyaluronic acid; poly(organo)phosphazenes; biodegradable polyurethanes; and PGA cross-linked to collagen.

9. The nerve regeneration conduit of claim 1, further comprising a layer of cells adhered to the inner surface of the support.

10. The nerve regeneration conduit of claim 9, wherein the cells are Schwann cells or olfactory ensheathing glial cells.

11. The nerve regeneration conduit of claim 10, wherein the layer contains from 15,000 to 165,000 Schwann cells per millimeter of conduit length.

12. The nerve regeneration conduit of claim 11, wherein the layer contains from 20,000 to 40,000 Schwann cells per millimeter of conduit length.

13. The nerve regeneration conduit of claim 9, further comprising a layer of extracellular matrix material on the support.

14. The nerve regeneration conduit of claim 1, further comprising a hydrogel layer.

15. The nerve regeneration conduit of claim 14, wherein the hydrogel layer has a thickness of 5 to 120 μm.

16. The nerve regeneration conduit of claim 15, wherein the hydrogel layer has a thickness of 10 to 50 μm.

17. The nerve regeneration conduit of claim 14, wherein the hydrogel layer comprises a polymer selected from the group consisting of fibrin glues, Pluronics®, polyethylene glycol (PEG) hydrogels, agarose gels, PolyHEMA (poly 2-hydroxyethylmethacrylate) hydrogels, PHPMA (poly N-(2-hydroxypropyl) methacrylamide) hydrogels, collagen gels, Matrigel®, chitosan gels, gel mixtures (e.g., of collagen, laminin, fibronectin), alginate gels, and collagen-glycosaminoglycan gels.

18. The nerve regeneration conduit of claim 1, further comprising a multiplicity of microspheres.

19. The nerve regeneration conduit of claim 18, wherein the microspheres are immobilized in a hydrogel layer.

20. The nerve regeneration conduit of claim 14, wherein the hydrogel layer comprises a neurotrophic agent.

21. The nerve regeneration conduit of claim 18, wherein the microspheres comprise a neurotrophic agent.

22. The nerve regeneration conduit of claim 18, wherein the microspheres have a diameter of 1 to 150 μm.

23. The nerve regeneration conduit of claim 18, wherein the microspheres comprise a material selected from the group consisting of a polyhydroxyalkanoate, a polyester, a copolymer of glycolic acid and lactic acid (PLGA), a copolymer of lactic acid and ε-aminocaproic acid, a polycaprolactones, polydesoxazon (PDS), a copolymer of hydroxybutyric acid and hydroxyvaleric acid, a polyester of succinic acid; and cross-linked hyaluronic acid.

24. The nerve regeneration conduit of claim 23, wherein the microspheres comprise PLGA having an average molecular weight of 25 kD to130 kD.

25. The nerve regeneration conduit of claim 24, wherein the lactic acid:glycolic acid ratio is approximately 85:15.

26. The nerve regeneration conduit of claim 18, wherein the microspheres are arranged in a pattern to facilitate creation of a neurotrophic agent concentration gradient.

27. The nerve regeneration conduit of claim 26, wherein the gradient is radial.

28. The nerve regeneration conduit of claim 26, wherein the gradient is axial.

29. The nerve regeneration conduit of claim 20 or 21, wherein the neurotrophic agent is selected from the group consisting of FK506, αFGF, βFGF, 4-methylcatechol, NGF, BDNF, CNTF, MNGF, NT-3, GDNF, NT-4/5, CM101, inosine, spermine, spermidine, HSP-27, IGF-I, IGF-II, PDGF, ARIA, LIF, VIP, GGF, IL-1, and MS-430.

30. The nerve regeneration conduit of claim 20, wherein the hydrogel layer comprises two or more neurotrophic agents.

31. The nerve regeneration conduit of claim 21, wherein the microspheres comprise two or more neurotrophic agents.

32. The nerve regeneration conduit of claim 31, wherein the neurotrophic agents are in separate microspheres.

33. The nerve regeneration conduit of claim 31, wherein two or more neurotrophic agents are in a single microsphere.

34. A method of manufacturing a nerve regeneration conduit, the method comprising providing a porous biocompatible support comprising an inner surface and an outer surface; and forming the support into a roll such that a cross section of the roll approximates a spiral spanning from 8 to 40 rotations, with the outer surface of the support facing outward, relative to the origin of the spiral.

35. The method of claim 34, further comprising culturing a layer of cells on the support prior to forming the support into the roll.

36. The method of claim 34, further comprising depositing a hydrogel layer on the support before forming the support into a roll.

37. The method of claim 34, further comprising incorporating a multiplicity of microspheres into the conduit.

38. The method of claim 37, wherein the microspheres comprise a neurotrophic agent.

39. A method of facilitating regeneration of a transected nerve across a nerve gap defined by a proximal end of the transected nerve and a distal end of the transected nerve, the method comprising coapting the proximal end of the transected nerve to a first end of the conduit of claim 1, and coapting the distal end of the transected nerve to a second end of the conduit.

40. A method of facilitating regeneration of a crushed nerve, the method comprising providing a porous biocompatible support comprising an inner surface and an outer surface; culturing a layer of cells on the support; and rolling the support around the crushed nerve.

41. The method of claim 40, further comprising depositing a hydrogel layer on the support before rolling the support around the crushed nerve.

42. The method of claim 40, further comprising incorporating a multiplicity of neurotrophic agent-laden microspheres into the conduit.

43. The nerve regenerating conduit of claim 14, wherein the hydrogel further comprises cells.

44. The nerve regenerating conduit of claim 1, wherein the support further comprises spacer members extending from the inner surface of the support.

45. The nerve regenerating conduit of claim 1, wherein the support is loaded with one or more neurotrophins.

46. The nerve regenerating conduit of claim 45, wherein the one or more neurotrophins are distributed in a gradient in the support.